

Office of Civilian Radioactive Waste Management



Civilian Radioactive Waste Management System

Waste Acceptance System Requirements Document

Revision 03

(E00000000-00811-1708-00001)

April 1999

***U. S. Department of Energy
Office of Civilian Radioactive Waste Management***

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***U. S. Department of Energy
Office of Civilian Radioactive Waste Management
Washington, DC 20585***

Office of Civilian Radioactive
Waste Management

QA: N/A

Page: 1

Of: 1

BCCB CHANGE DISPOSITION SUMMARY RECORD

1. BCP No. BCP-03-99-0001	1a. BCP Rev. 0	1b. BCP Title Issue/Baseline Rev. 3 of the Waste Acceptance System Requirements Document (WA-SRD)	1c. Current BCCB Level OATI-Level 2
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2. DISPOSITION RECOMMENDATION:

BOARD MEMBER	RECOMMENDATION(S)
James Carlson, RW-44	Approve (No Comments)
Jeffrey Williams, RW-46	Approve (Comments Resolved)
Syed Bokhari, RW-53	Approve (No Comments)
Carl Weber, RW-3	Approve (No Comments)
Mark Frei, EM-30	Approve (No Comments)
David Huizenga, EM-60	Approve (No Comments)
Glenn Mowbray, NNPP	Approve (No Comments)
Laura Holgate, MD-1	Approve (No Comments)

DIRECTIVE

<p>3. CHANGE DISPOSITION: * See Field No. 5.</p> <p><input checked="" type="checkbox"/> APPROVE <input type="checkbox"/> DEFER*</p> <p><input type="checkbox"/> APPROVE WITH CONDITIONS* <input type="checkbox"/> CANCEL*</p> <p><input type="checkbox"/> DISAPPROVE* <input type="checkbox"/> ENDORSED TO BOARD LEVEL</p>	<p>4. BCCB CHAIRPERSON SIGNOFF AND DISPOSITION DATE</p> <p>PRINT NAME: <u>Dwight Shalor, Chairman OATI BCCB</u></p> <p>SIGNATURE: <u>[Signature]</u></p> <p>DATE: <u>4-30-99</u></p>
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5. *CHAIRPERSON'S JUSTIFICATION/CONDITIONS/LIMITATIONS

☐ See Continuation Page

6. DIRECTIVE/IMPLEMENTING INSTRUCTIONS FOR IMPACTED DOCUMENT(S)

☐ See Continuation Page

7. DIRECTIVE/IMPLEMENTING INSTRUCTIONS FOR IMPACTED CONFIGURATION ITEM(S)

RW-46: Within 30 working days of receipt of this directive, RW-46 shall publish the WA-SRD, Rev. 3.

EM-30: Update trace of requirements, as needed.

EM-60: Update trace of requirements, as needed.

NNPP: Update trace of requirements, as needed.

MD-1: Update trace of requirements, as needed.

☐ See Continuation Page

**OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT PROGRAM
BASELINE CHANGE CONTROL BOARD
REVISION/CHANGE RECORD**

Document Number: DOE/RW-0351P/E00000000-00811-1708-00001
Document Title: Waste Acceptance System Requirements Document

Rev/DCN Number & Date	BCP Number	Revision/Change Description	Pages Affected
Rev. 01 March 1994	BCP-00-94-0001	Incorporates the Multi-Purpose Canister (MPC) concept into the CRWMS technical baseline.	All
Rev. 01, DCN 01 May 1995	BCP-00-94-0005	Resolves issues needed for the procurement of the MPC system.	Misc.
Rev. 02 May 1996	BCP-00-94-0005	General revision to incorporate the Program Approach.	All
Rev. 02, DCN 01 June 1996	BCP-00-96-0002	MPC Policy Change - The CRWMS will accept and accommodate a variety of cask/canister systems for commercial SNF which are currently available or are being developed. These may be individual spent fuel assemblies; or single, dual or triple purpose cask or canister systems. The existing MPC design, if deployed, will be in accordance with the MPC procurement specification.	Misc.
Rev. 02, DCN 02 December 1996	BCP-00-96-0009	Streamline of Requirements Documents - The Waste Acceptance System Requirements Document (SRD), Storage SRD and Transportation SRD are transferred to the WAST Project (Level II).	All
Rev. 03 April 1999	BCP-00-99-0001	Transfer acceptance requirements for government-owned nuclear materials and update changes in Waste Acceptance policy.	All

WBS: 9.2.1
QA: L

Civilian Radioactive Waste Management System

Waste Acceptance System Requirements Document

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April 1999

Prepared by:

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Office of Civilian Radioactive Waste Management
Office of Acceptance, Transportation, and Integration
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TBV/TBD Log

Number	Section Number	Resp. Org.	Due Date	Brief Description
TBV 3	4.2.3.1.H.1	RW-44	TBD	Environmental Assessment Benchmark Glass (ASTM C 1285-94)
TBV 4	4.2.3.2.C.2	RW-44	TBD	DOE SNF Canister Specifications
TBV 5	4.2.3.2.E	YMSCO	TBD	Thermal output of DOE SNF canister
TBV 6	4.2.3.1.A.2 4.2.3.1.A.5.b 4.2.3.1.A.4 4.2.3.1.A.6 4.3.2.1.K	EM	TBD	Rationales for Hanford 15 foot canister requirements
TBV 7	4.2.3.A.1	YMSCO	TBD	Canister gas leak rate
TBV 8	4.2.3.A.2	YMSCO	TBD	Canister internal gas pressure
TBV 9	4.2.3.A.3	YMSCO	TBD	Maximum detectable amount of organic
TBV 10	4.2.3.2.D	YMSCO	TBD	Maximum gamma-ray dose
TBV 11	4.2.3.1.K	RW/EM	TBD	Right-circular, cylindrical cavity specifications
TBD 7	4.2.3.1.M.1	MD/EM	TBD	Final design and configuration of IPWF canisters following NEPA decision process

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1. INTRODUCTION

1.1 PURPOSE

The technical requirements for the Civilian Radioactive Waste Management System (CRWMS) are established in the *Nuclear Waste Policy Act of 1982* (NWPA) and in a variety of Federal regulations, Department of Energy (DOE) directives and orders, and other Government documents. In accordance with the Strategic System Management Policy document, and the Memoranda of Agreement (MOAs) between the Office of Civilian Radioactive Waste Management (RW) and the Office of Environmental Management (EM) and RW and the Naval Nuclear Propulsion Program (NNPP), the CRWMS technical requirements, and any internally generated criteria (e.g., storage, disposal) are documented in the RW technical baseline, Figure 1-1.

The Civilian Radioactive Waste Management System Requirements Document (CRD) provides top-level policy necessary for the design and engineering of the Civilian Radioactive Waste Management System (CRWMS). The Waste Acceptance System Requirements Document (WA-SRD) defines the acceptance criteria for commercial spent nuclear fuel (SNF) and Government-owned nuclear materials expected to be received by the CRWMS, as well as system-level performance requirements for the Waste Acceptance System Element (WA). The development and control of the WA-SRD is subject to the requirements of the *OCRWM Quality Assurance Requirements and Description document* (QARD) (DOE/RW-0333P).

1.2 WA FUNCTIONS

The following is the decomposition of the function “Accept Waste.” These functions are described in greater detail in Section 1.4.1 and Appendix C. The *Physical System Requirements-Accept Waste* document (DOE/RW-0369) served as a reference for establishing these functions:

- A. **Define Acceptance Criteria.** Determine the conditions necessary to be met by the SNF and high-level waste (HLW), in order for DOE to be able to accept it for disposal including defining standard and nonstandard waste forms. For the purposes of this document, SNF consists of commercial SNF, which may include mixed oxide fuel, and DOE SNF. HLW includes Immobilized Plutonium Waste Form (IPWF).
- B. **Establish Contracts/Agreements.** Develop, execute, and maintain written agreements between DOE and Purchasers/Custodians/Producers that include terms, conditions, and criteria for acceptance and related services, and responsibilities of each party.

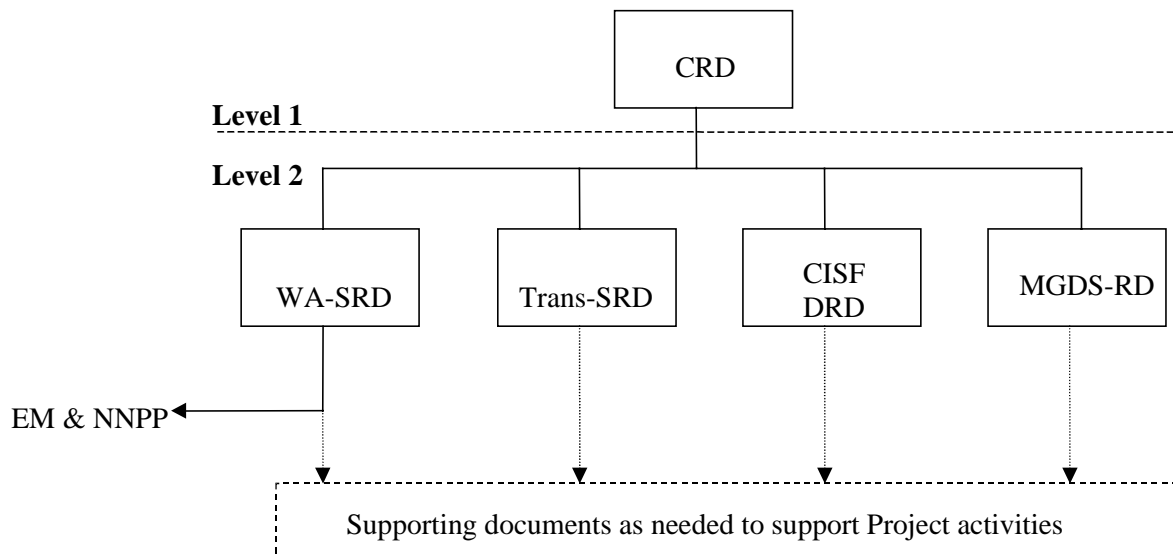


Figure 1-1. RW Technical Baseline

- C. **Plan for Acceptance.** Establish and provide the data on SNF and HLW characteristics and the Purchasers/Custodians/Producers site capabilities and requirements, as well as the CRWMS capabilities and requirements. Sub-functions include: Allocate Waste System Capacity; Identify Waste Location/Characteristics; Define Site Interface Capabilities; and Schedule WA Preparations (e.g. Acceptance Priority Ranking (APR), Annual Capacity Ranking (ACR), Delivery Commitment Schedule (DCS), and Final Delivery Schedule (FDS)).
- D. **Verify Preparations.** Verify the identified materials to be delivered are in agreement with their corresponding documentation. Verification may be accomplished by certification by the Purchaser/Custodian/Producer.
- E. **Accept SNF and HLW Title/Custody and Documentation.** Transfer documents between DOE and the Purchaser/Custodian/Producer at the time of acceptance. Documents include certification of cask transportation readiness. Confirm completeness and compliance, accept title/custody, and turn over to Transportation for off-site removal.
- F. **Resolve Improperly Described SNF and HLW.** When a discrepancy is found with the SNF and HLW after RW has taken title/custody to it, make arrangements with the Purchaser/Custodian/Producer to take corrective action and/or appropriate mitigative measures.
- G. **Support Fee Collection.** Verify and assess the adequacy of fees paid into the Nuclear Waste Fund (NWF) and recommend adjustment of the fee, if necessary, in order to ensure full cost recovery. Fees for waste disposal services will be paid by the

Purchasers/Custodians/Producers. DOE will regularly review and verify the accuracy of all fees paid into the NWF.

- H. **Control and Account for SNF and HLW Inventory.** Control, account for, and track the SNF and HLW inventory after it is accepted into the CRWMS and feed any system that tracks Material Control and Accountability (MC&A) data records. Additionally, the SNF and HLW will be tracked prior to acceptance into the CRWMS.

Figure 1-2 is a pictorial description of the CRWMS waste flow.

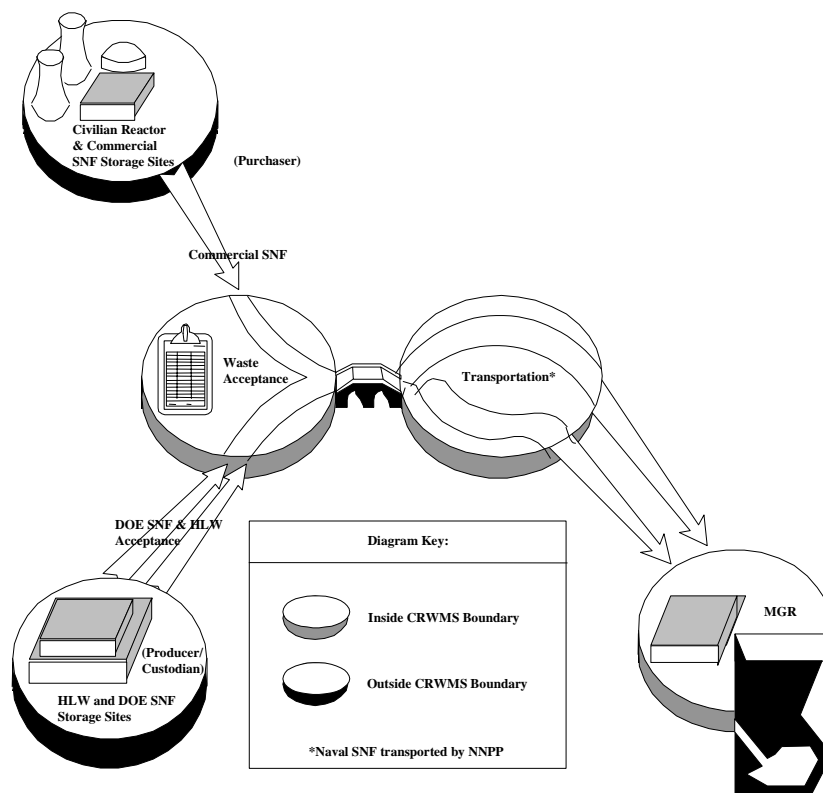


Figure 1-2. CRWMS Waste Flow

1.3 DOCUMENT ORGANIZATION AND DESCRIPTION

1.3.1 Document Organization

The WA-SRD is organized as follows:

- A. **Section 1: Introduction.** This section presents the system overview including the WA mission and system concept.
- B. **Section 2: Assumptions.** This section identifies planning assumptions that can not yet be incorporated as requirements.
- C. **Section 3: Requirements.** This section contains all requirements on the WA, including performance characteristics and interface requirements.
- D. **Section 4: Acceptance Criteria for SNF and HLW.** This section contains the acceptance criteria that must be met in order for commercial SNF, HLW, and Government managed-nuclear materials to be accepted into the CRWMS.
- E. **Section 5: Conformance Verification.**

Reserved.
- F. **Appendices:**
 - Appendix A: Glossary
 - Appendix B: Acronyms and Abbreviations
 - Appendix C: WA Function Description

1.3.2 Document Description

Section 1.4 establishes the description of the system in terms of functions and segments and the relationship between the two. Section 3 addresses requirements on WA and the Transportation system. Section 4 contains acceptance criteria for Purchasers, Producers and Custodians.

The legal or regulatory basis for requirements is documented on Requirements Analysis Sheets (RAS) in the Quality Assurance (QA) record for the WA-SRD; these records are not included within the WA-SRD. These sheets provide a statement of the requirement as it appears in the WA-SRD, a statement of the original source requirement(s) and, where applicable, a rationale for any interpretation of the basic requirement.

1.4 SYSTEM DEFINITION

Sections 302(a)(1) and 302(a)(5) of the NWPA authorize the Secretary of Energy to enter into contracts with the owners and generators of SNF and HLW and take title to their SNF and HLW as expeditiously as practicable upon request, in return for payment of fees.

The functions, function flow diagrams, and system description, are contained in the following sections.

1.4.1 WA Functions - Accept Waste

With the mission of WA identified as managing the acceptance of SNF and HLW into the CRWMS from the Purchasers/Custodians/Producers of such waste and to account for the inventory of the waste in the CRWMS, a functional analysis activity was performed to identify the essential functions that the system must perform. *Physical System Requirements - Accept Waste* documented the first iteration of that functional analysis and was used as the primary reference source of the functions for WA identified in this document.

The Accept Waste Function includes the activities and requirements for observing and verifying all aspects of the CRWMS readiness to accept waste, provide system-wide safeguards and security coordination, and to account for the inventory of waste in the CRWMS. As shown in Table 1-1 this function includes verification of component availability and delivery schedule, transportation system capacity, and a final verification check that the waste acceptance rate complies with contracts and agreements with Purchaser, Custodian, and Producer. The Accept Waste Function is necessary to properly document and receive waste for title transfer, and to ensure the system is prepared to receive and transport waste.

The reference numbers following the function activity title in Table 1-1 correspond to the function numbers and function descriptions contained in Appendix C, Waste Acceptance Function Descriptions. The reference numbers are provided for identification of level of indenture and are not intended to prescribe a sequencing of the identified functions.

1.4.2 Waste Acceptance Functional Relationships

Figure 1-3 shows the function flow diagram for the primary functions of the CRWMS. Additional function flow diagrams are contained in Appendix C. These diagrams identify the primary interactions between the functions in accepting SNF and HLW.

1.4.3 System Description

Waste Acceptance is an integral part of the total CRWMS in which all system elements, segments, and subsystems and facilities are optimized as parts of a single system. WA will interface the CRWMS with the Purchasers, Custodians, and Producers by establishing contracts or agreements to accept waste and define the acceptance criteria.

1.4.4 Function and Requirement to Architecture Cross-References

The function flow diagrams are used to identify the top-level segments of the overall system architecture, to which particular waste acceptance functions and requirements are allocated. The requirements for the functions are reviewed and the segments are defined to meet the requirements.

Table 1-1. Waste Acceptance Function List

Function Title	Reference Number
Accept Waste	1.1
Define Waste Acceptance Criteria	1.1.1
Establish Contracts/Agreements	1.1.2
Plan for Waste Acceptance	1.1.3
Allocate Waste System Capacity	1.1.3.1
Collect Waste Data	1.1.3.1.1
Rank/Order Waste	1.1.3.1.2
Allocate Annual Capacity to Purchasers/Custodians/Producers	1.1.3.1.3
Identify Waste Locations/Characteristics	1.1.3.2
Evaluate Delivery Commitment Schedule (DCS)	1.1.3.2.1
Evaluate DCS Exchange Requests	1.1.3.2.2
Evaluate Request for Nonstandard Waste Delivery	1.1.3.2.3
Evaluate Final Delivery Schedule (FDS)	1.1.3.2.4
Validate Description of Waste	1.1.3.2.5
Define Site Interface Capabilities	1.1.3.3
Schedule WA Preparations	1.1.3.4
Observe Waste Preparations	1.1.4
Observe Preliminary Waste Preparations	1.1.4.1
Observe Waste Preparations & Loading	1.1.4.1.1
Record Waste Loading	1.1.4.1.2
Verify Waste Description	1.1.4.2
Notify Purchaser/Custodian/Producer of Improperly Described Waste	1.1.4.3
Accept Waste Title/Documentation	1.1.5
Resolve Improperly Described Waste	1.1.6
Support Fee Collection	1.1.7
Control and Account for Waste Inventory	1.1.8
Perform Material Control	1.1.8.1
Provide Material Accounting	1.1.8.2
Provide Material Tracking	1.1.8.3
MC&A General Management	1.1.8.4

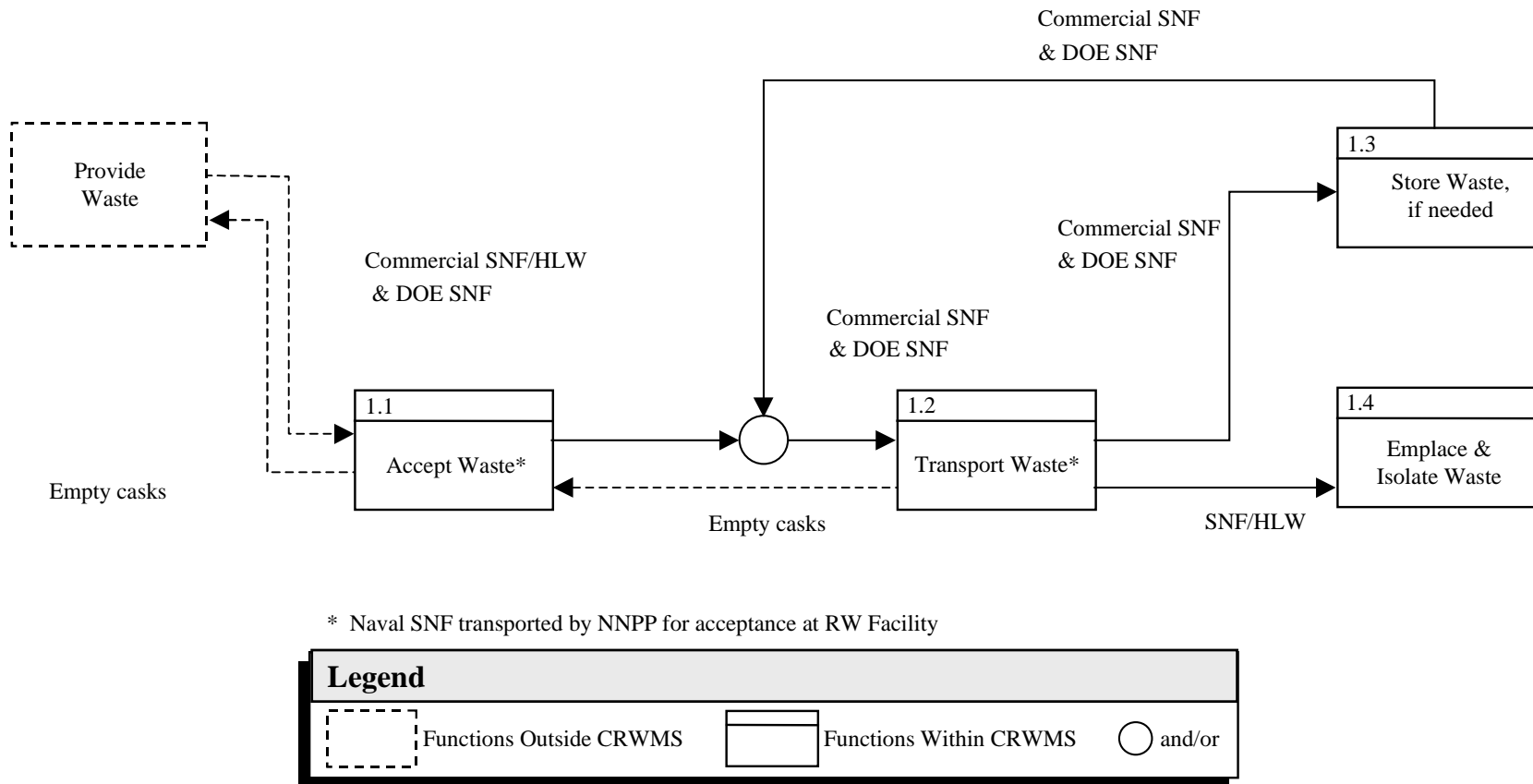


Figure 1-3. Manage Waste Disposal Function Flow Diagram

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2. ASSUMPTIONS

Reserved. See Section 2.4 of the CRD.

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3. REQUIREMENTS ON THE CRWMS

3.1 REGULATORY REQUIREMENTS

3.1.1 Primary Regulatory Requirements

Reserved. See Section 3.1.1 of the CRD.

3.2 WASTE ACCEPTANCE ELEMENT PERFORMANCE REQUIREMENTS

Reserved.

3.3 TRANSPORTATION ELEMENT PERFORMANCE REQUIREMENTS

Reserved.

3.4 CRWMS INTERFACE REQUIREMENTS

3.4.1 Waste Acceptance and Transportation - Monitored Geologic Repository

Reserved. See Section 3.6.2.1 of the CRD. Additional requirements may be identified in MGR/Transportation interface documents as they are developed.

3.4.2 Waste Acceptance and Transportation - Interim Storage Facility

Reserved.

See Section 3.6.2.2 of the CRD. Additional requirements may be identified in Waste Acceptance and Transportation and Centralized Interim Storage Facility interface documents, as they are developed.

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4. ACCEPTANCE CRITERIA FOR SNF AND HLW

This section contains acceptance criteria that must be met in order for SNF and HLW to be accepted into the CRWMS. Section 4.1 applies to commercial SNF, and simply references the Standard Contract. Acceptance criteria for commercial SNF in dual-purpose and multi-purpose canisters are in development and will be incorporated into this section as guidelines. These guidelines will be finalized as acceptance criteria for commercial SNF upon incorporation into the individual contracts with the utilities.

Section 4.2 applies to Government-managed nuclear materials. In accordance with the EM/RW and NNPP/RW MOAs, RW has developed these acceptance criteria in coordination with EM, MD and NNPP, and it is anticipated that they will be adequate for repository licensing. However, because the NRC will make the final determination of the adequacy of acceptance criteria in conjunction with issuing the repository license amendment to emplace, these criteria are not final and changes to them may occur as the licensing process progresses.

4.1 COMMERCIAL SNF

The requirements in this section are applicable to the interface between Waste Acceptance and Transportation and the Purchasers.

- A. Commercial SNF shall meet the requirements specified in 10 CFR Part 961, as modified by individual Purchaser contracts. Contracts may include mixed-oxide spent fuel fabricated from surplus weapons-usable plutonium.
- B. Dual-Purpose Canister Guidelines - Reserved.
- C. Multi-Purpose Canister Guidelines - Reserved.

4.2 GOVERNMENT - MANAGED NUCLEAR MATERIALS

4.2.1 Process Requirements

The requirements in this section are applicable to the interface between Waste Acceptance and Transportation and the Producer/Custodian.

- A. Producer/Custodian and Waste Acceptance and Transportation shall ensure that waste forms and any canisters and CRWMS System, Structure, and Component (SSC) designs are physically, chemically, dimensionally, functionally, and operationally compatible.
- B. Waste Acceptance and Transportation shall exchange planning and operational information with the Purchasers/Producers/Custodians¹, as required in 10 CFR Part

¹ For purposes of this document, West Valley Demonstration Project (WVDP), which has commercial HLW, is considered a "Purchaser" only for contract/agreement purposes; otherwise WVDP is considered a "Producer."

961 and the EM/RW MOA, and NNPP/RW MOA for campaign planning and preparation, and to accomplish cask loading and off-site transport.

- C. For HLW as defined in the EM/RW MOA and for commercial SNF, Waste Acceptance and Transportation shall provide appropriately configured NRC-certified transportation casks, and provide the required ancillary equipment to Purchaser/Producer sites.
- D. Waste Acceptance and Transportation shall verify that the SNF or HLW is properly loaded and packaged in accordance with the transportation cask certificate of compliance and the cask is properly marked and labeled and ready for transportation (including appropriate shipping documents) in accordance with applicable regulations and RW-established safeguards verification procedures prior to acceptance for transportation to a CRWMS facility.
- E. Government-managed nuclear materials that meet the regulatory acceptance criteria specified in Sections 4.2.2 and 4.2.3 shall be accepted into the CRWMS.
- F. A nonconforming waste form, defined as Government-managed nuclear material that does not meet the applicable requirements in Sections 4.2.2 and 4.2.3 shall not be accepted into CRWMS unless, after evaluation, it is determined to be a non-standard waste form (see Item G below).
- G. A nonconforming waste form that has been reviewed and deemed acceptable for entry into the CRWMS shall be accepted as a nonstandard waste form.
- H. EM shall provide requirements to MD to ensure that IPWF can comply with CRWMS acceptance criteria.

4.2.2 Acceptance Criteria - Imposed by External Regulations

The requirements of this section apply to all Government-managed nuclear materials which are planned to be accepted into the CRWMS for disposal.

- A. All HLW and/or SNF shall comply with the applicable provisions of the NWSA, appropriate U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), and NRC regulations for transportation, storage (if approved) and geologic disposal. The latter include but are not limited to 10 CFR Part 60, 10 CFR Part 71, 10 CFR Part 72 and 10 CFR Part 73. To ensure successful site suitability and licensing, the WA-SRD must reflect the changes ensuing from NRC review of these regulations. The WA-SRD, however, is the document where all applicable waste acceptance criteria reside.

B. General Criteria

1. The HLW and/or SNF shall be in solid form and placed in sealed canisters. A limited amount of bare SNF may be accepted by RW in accordance with the EM/RW MOA.
2. The HLW and/or SNF shall be consolidated, if in particulate form, (for example, by incorporation into an encapsulating matrix) to limit the availability and generation of particulates.
3. Combustible HLW and/or SNF shall be reduced to a form such that they are noncombustible in the repository environment unless it can be demonstrated that a fire involving the waste packages containing combustibles will not adversely affect other waste packages, any SSCs important to safety, or the repository's ability for waste isolation.

C. Criticality

1. All HLW and/or SNF systems for loading, transporting, handling, storing, retrieving, emplacing, and isolating radioactive waste shall be designed to ensure that together with the components of the CRWMS, nuclear criticality is not possible unless at least two unlikely, independent, and concurrent or sequential changes have occurred in the conditions essential to nuclear criticality safety. All system components (e.g., the set of canisters in a co-disposal configuration) must be such that the system of which they are part will comply with this requirement.
2. All HLW and/or SNF systems shall be designed for criticality safety assuming occurrence of design basis events.
3. The calculated effective multiplication factor (k_{eff}) must be sufficiently below unity to show at least a 5 percent margin, after allowance for bias in the method of calculation and the uncertainty in experiments used to validate the method of calculation. All system components (e.g., DOE SNF and any canister) must be such that the system of which they are part will comply with this requirement.

D. Confinement

1. The HLW and/or SNF shall not contain or generate materials that are explosive, pyrophoric, or chemically reactive (in the repository environment) in a form or amount that could compromise the repository's ability to perform its waste isolation function or satisfy its performance objectives.
2. The HLW and/or SNF shall not contain or generate free liquids in the waste package to an amount that could compromise the ability of the waste package to achieve the performance objectives related to containment of the waste form or

result in spillage and spread of contamination in the event of waste package perforation during the period from placement in a waste package through permanent closure of the repository.

E. Canister Label

1. The canister label shall be an integral part of the canister (e.g., embossed). EM shall maintain label integrity until responsibility of the HLW canister has been transferred to RW at time of acceptance.
2. The canister label shall have a unique alphanumeric identifier and this identifier must appear on all documentation pertinent to that particular canister.
3. The canister label shall not impair the integrity of the canister.

4.2.3 Acceptance Criteria Imposed by RW

A. Confinement

1. Inert cover gas leak rate of the outermost closure shall be less than 1×10^{-4} atm-cc/sec. **(TBV 7)**
2. After closure, the internal gas pressure of the canistered waste form shall not cause the canister to deform or leak during normal operations. For HLW, after closure, the canistered waste form shall not contain or generate free gas other than air, residuals of air, inert cover gas, and radiogenic gases with an immediate internal gas pressure not to exceed 150 kPa (approximately 22 psia) at 25°C. **(TBV 8)**
3. The waste form shall not contain detectable amounts of organic materials. **(TBV 9)**

B. Resource Conservation and Recovery Act (RCRA) - The CRWMS shall only accept HLW and/or SNF that is not subject to regulation as hazardous waste under the RCRA Subtitle C for disposal in the first geologic repository licensed by NRC under the NWPA. Prior to acceptance for disposal, Producers/Custodians must determine and document that RCRA-regulated wastes are not present, and develop appropriate data to assure relevant state and/or EPA RCRA requirements are addressed.

C. Material Compatibility - The HLW and/or SNF and canister materials shall preclude chemical, electrochemical, or other reactions (such as internal corrosion) of the canister or waste package such that there will be no adverse effect on normal handling, transportation, storage, emplacement, containment, or isolation or on abnormal occurrences such as a canister drop accident and premature failure in the repository.

D. Surface Contamination - The level of non-fixed radioactive contamination may be determined by wiping an area of 300 cm² of the concerned surface with an absorbent material, using moderate pressure, and measuring the activity on the wiping material. Sufficient measurements must be taken in the most appropriate location to yield a representative assessment of the non-fixed contamination levels. Other methods of assessment of equal or greater efficiency may be used. At the time of acceptance, the non-fixed radioactive contamination on the wiping material shall not exceed 2,200 dpm/100 cm² of canister surface wiped for alpha emitting radionuclides and 22,000 dpm/100 cm² of canister surface wiped for beta and gamma emitting radionuclides.

E. Canister Label

1. The canister label shall be a material compatible with the canister material and the waste package material.
2. The canister label shall be visible on the top and/or side of the canister.
3. The canister label shall not cause the dimensional limits to be exceeded.

F. Safeguards Verification

1. SNF and/or HLW - During transportation cask loading and prior to acceptance by RW for transportation to the CRWMS facility, the SNF and/or HLW description of the shipping lot shall be subject to safeguards verification by RW.
2. Material Control and Accounting
 - a. The Producers shall provide information through the HLW Production Records and the Custodians shall provide information through the DOE SNF site compliance documentation to support the RW Material Control and Accounting program for waste acceptance. The data shall be generated, documented, maintained and reported under the OCRWM QARD or an NRC accepted QA Program.
 - b. A Nuclear Material Transaction Report (DOE/NRC Form-741) shall be completed and distributed by the Producer/Custodian, whenever the HLW and/or SNF is transferred into CRWMS. This shall include:
 - (1) The total and fissile uranium and plutonium content of each canister in grams.
 - (2) The concentration of plutonium in grams per cubic meter for each canister. Concentrations in excess of 2500 grams/cubic meter may be subject to additional safeguards requirements.

- (3) The ratio by weight of the total element of the following isotopes: U-233, U-234, U-235, U-236, U-238, Pu-238, Pu-239, Pu-240, Pu-241, and Pu-242.

4.2.3.1 Specific Acceptance Criteria for HLW

A. Canister Specifications (e.g., dimensions, weight, etc.)

1. The standard vitrified HLW form shall be borosilicate glass sealed inside an austenitic stainless steel canister(s) with a concentric neck and lifting flange.
2. Total length shall be 3.000 meters (+0.005, -0.020 m)² or alternatively 4.500 meters (+0.005, -0.020 m)¹. **(TBV 6)**
3. Diameter shall be 61.0 centimeters (+1.5, -1.0 cm)².
4. Weight shall not exceed 2500 kilograms or alternatively 4200 kilograms for the 4.5 m canister. **(TBV 6)**
5. Fill height shall be equivalent to at least:
 - a. 80 percent of the volume of the empty canister for the West Valley Demonstration Project (WVDP) and the Savannah River Site (SRS).
 - b. 87 percent of the volume of the empty 4.5 m canister. **(TBV 6)**
6. Total heat generation rate shall not exceed 1500 watts per 3.0 m canister at the year of shipment or alternatively 2540 watts per 4.5 m canister at the year of shipment. **(TBV 6)**

B. Material Compatibility - The Producer shall report to RW the American Society for Testing and Materials alloy specification (or other nationally recognized specification) and composition of the fill canister material, secondary canister material, canister label material, and any filler material used for welding, and the method of fabrication of the fill canister and any secondary canister.

C. Radiation Protection Criteria - The canistered HLW shall not exceed a maximum surface gamma dose rate of 10⁵ rem per hour and a maximum neutron dose rate of 10 rem per hour at the time of shipment. The dose rate may either be measured or calculated from a radionuclide content.

² The minimum dimension may be measured prior to filling.

D. Surface Contamination

1. The Producer shall inspect the canistered waste form and remove visible waste glass from the exterior surface of the canister prior to shipment.
2. The Producer shall report to RW an estimate of the amount of canister material (particularly wall thickness) removed during decontamination of the canister surface.

E. Chemical Composition

1. The Producer shall report to RW the chemical composition and crystalline phase projections for vitrified HLW.
2. The Producer shall report to RW the oxide concentration of elements present in concentrations greater than 0.5 percent by weight (of glass) and the estimate of the error of these concentrations for vitrified HLW.

F. Radionuclide Inventory - The Producer shall report to RW the estimated total and individual canister inventory of radionuclides (in Curies) that have half-lives longer than 10 years and that are or will be present in concentrations greater than 0.05 percent of the total radioactive inventory. The estimates shall be indexed to the years 2010 and 3110. The Producer shall also report the estimate of the uncertainty with the radionuclide inventories.

G. Phase Stability and Integrity

1. The Producer shall ensure the phase structure and composition of the vitrified HLW are not degraded after initial cooldown by maintaining the waste form below 400°C to ensure the glass transition temperature is not exceeded.
2. The Producer shall provide the Time Temperature Transformation diagrams for the vitrified HLW.

H. Product Consistency

1. The Producer shall demonstrate control of waste form production by comparing production samples or process control information, separately or in combination to the Environmental Assessment benchmark glass using the Product Consistency Test or equivalent. **(TBV 3)**
2. For acceptance, the mean concentrations of lithium, sodium, and boron in the leachate, after normalization for the concentrations in the glass, shall be less than those of the benchmark glass.

I. Canister Impact Characteristics

1. Requirements shall be allocated to the handling facility, barriers, transfer cell and canister to protect the safety of the work force and the public. The HLW canisters shall be capable of withstanding a drop of 7 meters onto a flat, essentially unyielding surface without breaching or dispersing radionuclides.
2. Drop test results shall include information on the measured canister leak rates and canister deformation after the test.

J. Canister Handling

1. The Producer shall provide a grapple design suitable for use in loading or unloading a transportation cask with a standard 3.0 m HLW canister or a standard 4.5 m canister.
2. The grapple, when attached to the hoist and engaged with the flange, shall be capable of moving the canistered waste form in the vertical direction.
3. The grapple shall be capable of being remotely engaged with and remotely disengaged from the HLW canister flange.
4. The grapple shall be capable of being engaged or disengaged while remaining within the projected diameter of the waste form canister (61.0 centimeters (+1.5, -1.0 cm)).
5. The grapple shall include features that prevent inadvertent release of a suspended canistered waste form.

K. Condition at Delivery - At time of delivery, the HLW form shall stand upright without support on a flat horizontal surface and properly fit into a right-circular, cylindrical cavity (64 cm diameter (TBV 11**) and 3.01 m length or alternatively 64 cm diameter and 4.51 m length (**TBV 6**)).**

L. Reporting Requirements

1. The Producer shall submit documentation to RW to demonstrate compliance of the HLW form with CRWMS acceptance criteria. This documentation includes a WCP, WQR, Production Records, and Storage and Shipping Records.
2. EM, as the cognizant organization within DOE for HLW form production, shall produce waste form production specifications, which describe the form and content to demonstrate compliance with CRWMS acceptance criteria.

3. The WCP shall describe the Producer plan for demonstrating compliance with CRWMS acceptance criteria, including a description of tests, analyses, and process controls to be performed by the Producer. The WCP also identifies records that will be provided as evidence of compliance.
4. The WQR shall compile the results from waste form testing and analysis to demonstrate the ability of the Producer to comply with CRWMS acceptance criteria.
5. The Production Records shall describe the actual canistered waste form.
6. The Storage and Shipping Record shall describe the physical attributes of each canistered waste form and identify any unexpected events, such as thermal excursions, which have occurred during storage. Specifically, the Shipping records for HLW shall provide written documentation and certification:
 - a. of cask conditions and contents prior to transfer to the receiving party.
 - b. that the transportation cask subsystem has been packaged to meet DOE, DOT, and NRC requirements, and to transfer care, custody and control of the shipment.
 - c. of the activity in terms of the appropriate International System of Units (SI) (e.g. Becquerel, Terabecquerel, etc.) contained in each shipping package and the name of each radionuclide in each shipping package in accordance with 49 CFR Part 172.203(d)(1) and (4).
 - d. that the standard HLW did not exceed 400°C after initial cooldown to ensure the glass transition temperature was not exceeded.
7. Producer shall provide annual reports of waste generation and projections of quantities of vitrified HLW requiring disposal.
8. The Office of Environmental Management (EM) shall provide information concerning canister label in accordance with the WQR, the WCP and the Memorandum of Agreement between the Office of Civilian Radioactive Waste Management and EM.

M. Additional Requirements for Immobilized Plutonium Waste Form

1. The standard IPWF shall be can-in-canister, i.e., ceramic disks inside of stainless steel cylindrical cans (plutonium cans) which are arrayed within the typical defense HLW canister by magazines. Molten HLW glass is poured into the canister, allowed to cool and vitrify, and the HLW canister is appropriately sealed. **(TBD 7)**

2. Product Consistency - Reserved.
3. Compliance Documentation
 - a. Documentation shall be submitted to RW to demonstrate compliance of the IPWF HLW canisters with this WA-SRD in accordance with the requirements of OCRWM QARD. This documentation includes a compliance plan, qualification report, production records and storage and shipping records.
 - b. The compliance documentation shall describe the plan for demonstrating compliance with each requirement in this WA-SRD, including a description of tests, analyses, and process controls to be performed. The compliance documentation also identifies records that will be provided as evidence of compliance.
 - c. The results from waste form testing and analysis shall demonstrate the ability of the IPWF HLW to comply with this WA-SRD.
 - d. The production records shall describe the actual IPWF.
 - e. The physical attributes of each plutonium can shall be described and any unexpected events which have occurred during storage shall be identified. Specifically, records for plutonium cans shall provide written documentation and certification of can conditions (e.g., such as can corrosion, deformation, or weld defects) and contents prior to transfer to the receiving party.
 - f. The Producer shall report the chemical composition of and phase projection for the immobilized plutonium disks.
 - g. The Producer shall report to RW the oxide concentration of elements present in concentrations greater than 0.5 percent by weight and the estimate of the error of these concentrations for the Plutonium disk.
 - h. The Producer shall ensure that the temperature history associated with pouring vitrified HLW glass to form the IPWF will not degrade the ability of the immobilized plutonium waste form to meet the other acceptance specifications given in this document.

4.2.3.2 Specific Acceptance Criteria for DOE SNF

The following acceptance criteria are applicable to all DOE SNF, including naval SNF, intended for disposal in canisters. Upon request from EM, and approval by RW, DOE SNF may be accepted as bare fuel. The specific acceptance criteria for this bare fuel will be developed on a case by case basis.

Characteristics and amounts of the different types of DOE SNF are extracted from the EM Integrated Spent Nuclear Fuel Database System (ISNFDS). The DOE SNF inventory, projected to 2035, that will require disposal totals approximately 2502 MTHM. Table 4-1 contains a list of DOE SNF inventory projected for repository disposal. This inventory includes SNF owned or managed by the DOE and the NNPP. As a planning base, 2333 MTHM of DOE SNF will be allocated for disposal in the first repository.

Table 4-1. DOE SNF Types and Amount

SNF Type Group	Representative SNF Type	Mass (MTHM)	Volume (cubic meters)
1. Uranium Metal Matrix, Zirconium or Aluminum Clad	N-Reactor SNF, Single Pass Reactor SNF	2122	209
2. Uranium alloy fuel with Zirconium Clad	HWCTR	<1	1
3. Uranium Molybdenum Matrix, Zirc. Clad	Fermi Core	4	<1
4. Uranium Oxide Matrix, Zirc. or SS Clad	Intact Commercial SNF	99	52
5. Uranium Oxide Matrix, Failed Clad or Declad	TMI Core 2 Debris	87	241
6. Uranium Aluminum or Uranium Oxide Matrix, Aluminum Clad	Advanced Test Reactor SNF	9	150
7. Uranium-silicide, aluminum cladding	FRR MTR	12	53
8. Uranium-Carbide/Thorium-Carbide Matrix, with High Integrity Coating	Fort St. Vrain SNF	25	212
9. Uranium-Carbide/Thorium-Carbide Matrix, with Low Integrity Coating	Peachbottom SNF	2	17
10. Uranium and uranium-plutonium carbide	FFTF Carbide	<1	<1
11. Mixed Oxide Matrix	Fast Flux Test Reactor SNF	12	36
12. Uranium-Thorium Oxide Matrix, Zirconium or Stainless Steel Clad	Shippingport Light Water Breeder Reactor SNF, Pathfinder SNF	50	18
13. Uranium-Zirconium Hydride Matrix	Training Reactor, Isotopics, General Atomics (TRIGA)	2	8
14. Sodium-bonded	EBR-II Driver	a	a
15. Naval Propulsion Reactor SNF	Naval SNF	65	888
16. Miscellaneous SNF	Various one-of-a-kind SNF	11	20
Total		2502 ^{a, b}	1907 ^{a, b}

a Total does not include Metallic Sodium Bonded (Experimental Breeder Reactor (EBR)-II SNF, Fermi Blanket), 60 MTHM/27 m³ and Canyon Stabilization with EM Record of Decision (Savannah River Site Driver Fuel and Targets, EBR II Targets), 151 MTHM/97 m³, which are candidate fuels for treatment or processing prior to disposal.

b Totals may not sum due to rounding.

A. Transportation and Storage Certification

1. The cask/canister used for delivery of DOE SNF shall be NRC-approved for transportation under 10 CFR Part 71.
2. The DOE SNF storage system and equipment shall be certified for use at the CRWMS storage facility (if storage is needed).
3. Ancillary equipment and hardware and special tools and fixtures necessary to handle and transfer loaded canisters and storage modules at the CRWMS facility shall be proven concepts utilized at a facility regulated by NRC under 10 CFR Part 50 or 10 CFR Part 72.

B. Disposal Criteria - DOE SNF shall support overall repository performance requirements by meeting all acceptance criteria for the specific fuel grouping as bounded in the License Application design. Failure to comply with these criteria may result in the need for the Custodian to modify or repack the DOE SNF.

C. Canister Specifications (e.g., dimensions, weight, etc.) (TBV 4)

1. The canistered DOE SNF shall be standardized to accommodate waste package design.
2. Dimensions

DOE EM Large Canister (TBV 4)

Nominal Outer Diameter = 610 mm (24 in)

Maximum External Length = 4570 mm (179.92 in) & 3,000 mm (118.11 in)

DOE EM Small Canister (TBV 4)

Nominal Outer Diameter = 457 mm (18 in)

Maximum External Length = 4570 mm (179.92 in) & 3,000 mm (118.11 in)

NNPP Long Canister (TBV 4)

Nominal Outer Diameter = 1689.1 mm (66.5 in)

Maximum External Length = 5384.8 mm (212 in)

NNPP Short Canister (TBV 4)

Nominal Outer Diameter = 1689.1 mm (66.5 in)

Maximum External Length = 4749.8 mm (187 in)

3. The maximum weight of a loaded DOE SNF canister, fully loaded in its transportation overpack, shall not exceed 130 tons.

D. Radiation Protection Criteria - The canistered DOE SNF shall not exceed a maximum gamma-ray dose rate of 10^5 rem per hour and a maximum neutron dose rate of 10 rem per hour at a distance of 1 meter from any accessible surface without intervening shielding at the time of acceptance. (TBV 10)

- E. Thermal Considerations – The thermal output of the canistered DOE SNF at the time of acceptance shall be such that after packaging for disposal, the total thermal load of the waste package does not exceed 14.2 kilowatts (**TBV 5**).
- F. Canister Impact Characteristics - Requirements shall be allocated to the handling facility design and HVAC system, barriers, transfer cell and canister to protect the safety of the work force and the public. Canisters shall be evaluated on a case by case basis.
- G. Canister Handling
 - 1. Handling equipment design shall be provided suitable for use in loading or unloading the canistered DOE SNF (as handled at the repository) from a transportation cask or waste package.
 - 2. The handling equipment shall comply with applicable regulatory guidelines and national standards, such as Nuclear Regulatory Commission NUREG 0612 and American National Standards Institute (ANSI) N14.6 for lifting/handling devices.
 - 3. The handling equipment shall be capable of:
 - a. moving the canistered DOE SNF in the vertical direction when attached to the hoist and engaged.
 - b. engaging remotely with and disengaging remotely from the canistered DOE SNF.
 - c. engaging or disengaging while remaining within the projected perimeter of the canistered DOE SNF.
 - d. preventing with appropriate design features inadvertent release of a suspended canistered DOE SNF (not disengage under load).
 - e. allowing confirmation of engagement prior to lifting.
 - 4. A means shall be provided for lifting a canister after the lids and all SNF assemblies have been removed.
- H. Tamper-Safe and Inspection - Canistered DOE SNF (DPCs or MPCs) shall be designed to permit use of a tamper-safe seal as provided in 10 CFR Part 70.51(e)(1)(I) for safeguards purposes. This seal may be accomplished by either seal welding the canister or installing a tamper-indicating device. It must be designed such that the integrity of the weld or tamper-indicating devices may be inspected periodically.

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5. CONFORMANCE VERIFICATION

Reserved. See Section 2.3 of the CRD.

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APPENDIX A

GLOSSARY

Title: Waste Acceptance System Requirements Document

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GLOSSARY

Acceptance, as used in this document, is the process by which the Department will take title to, and physical possession of, SNF or HLW from the Purchaser/Custodian/Producer to the DOE/OCRWM. Conceptually, acceptance is accomplished by execution of the primary WA functions. Specifically, acceptance is the planning, preparation, and completion of the documentation necessary to transfer title. Any actual handling of the SNF and HLW related to their transfer is accomplished by CRWMS elements other than WA, and/or by the Purchaser/Custodian/Producer.

Architecture is the physical system actually built, found, or selected to perform a function subject to its stated requirements.

As low as is reasonably achievable (ALARA) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in 10 CFR 20 as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest. (As defined in 10 CFR 20.1003.)

Atomic Energy Defense Activity is any activity of the Secretary performed in whole or in part in carrying out any of the following functions:

- A. naval reactors development;
- B. weapons activities including defense inertial confinement fusion;
- C. verification and control technology;
- D. defense nuclear materials production;
- E. defense nuclear waste and materials by-products management;
- F. defense nuclear materials security and safeguards and security investigations; and
- G. defense research and development.

Blending is (1) selecting SNF assemblies of different characteristics for inclusion in an MPC, transportation cask, storage mode, or waste package, or (2) selecting HLW of different characteristics for inclusion in a transportation cask or waste package to meet design goals.

Borosilicate Waste Glass is glass typically containing approximately 20 to 40 wt. percent waste oxides, 40 to 65 wt. percent silica, 5 to 10 wt. percent boron oxide, and 10 to 20 wt. percent alkali oxides, plus other oxide constituents.

Canister is the structure surrounding the waste form (e.g., HLW immobilized in borosilicate glass) that facilitates handling, storage, transportation, and/or disposal. A canister is a metal receptacle with the following purpose: (1) for solidified HLW, its purpose is a pour mold and (2) for SNF, it may provide structural support for intact SNF, loose rods, nonfuel components, or confinement of radionuclides. (See definition of multi-purpose canister.)

Cask is a container for shipping or storing spent nuclear fuel and/or canistered high-level waste that meets all applicable regulatory requirements.

Cask Subsystem is defined under transportation cask subsystem.

Civilian Radioactive Waste Management System (CRWMS) is the composite of sites, facilities, systems, equipment, materials, information, activities, and personnel required to perform those activities necessary to manage spent nuclear fuel and high-level radioactive waste disposal.

Commercial High-Level Radioactive Waste (CHLW) is the high-level radioactive waste, as defined by NWPA 42USC10101(12), resulting from reprocessing spent nuclear fuel in a commercial facility.

Commercial Spent Nuclear Fuel (commercial SNF) is SNF, of domestic origin, that was generated in a civilian nuclear power reactor, and includes (1) intact, non-defective fuel assemblies; (2) failed fuel assemblies in canisters; (3) fuel assemblies in canisters; (4) consolidated fuel rods in canisters; (5) nonfuel components inserted in PWR fuel assemblies, including, but not limited to, control rod assemblies, burnable poison assemblies, thimble plug assemblies, neutron source assemblies, and instrumentation assemblies; (6) fuel channels attached to BWR fuel assemblies; and (7) nonfuel components and structural parts of assemblies in canisters. (As defined in 10 CFR 961.11 and 10 CFR 961, Appendix E.)

Contract is the agreement set forth in 10 CFR 961.11 and any duly executed amendment or modification thereto.

Custodian means any government agency that possesses SNF that is a candidate for disposal in the CRWMS.

Defense High-Level Radioactive Waste (DHLW) is the high-level radioactive waste, as defined by NWPA 42USC10101(12), resulting from reprocessing spent nuclear fuel in a defense facility.

Disposal is the isolation of radioactive wastes from the accessible environment. (As defined in 10 CFR 60.2.) Disposal means the emplacement in a repository of high-level radioactive waste, spent nuclear fuel, or other highly radioactive material with no foreseeable intent of recovery, whether or not such emplacement permits the recovery of such waste. (As defined in 10 CFR 961.11 and NWPA 42USC10101(9).)

DOE-Owned Spent Nuclear Fuel (DOE SNF) is SNF that is currently managed by DOE, and includes fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated. DOE SNF includes, but is not limited to, production reactor fuel, research reactor fuel, naval fuel, and some fuel from commercial power reactors. The inventory of DOE SNF projected to the year 2035 is provided in Table 3-5 in this document.

DOE/NRC Form-741 is a Nuclear Material Transaction Report and is completed whenever SNF or HLW is transferred or received. [10 CFR 75.31, .32, .33, .35]

DOE/NRC Form-742 is a Material Balance Report and when completed, documents the quantities of SNF and/or HLW contained at an installation as of the initial inventory reporting date. [10 CFR 75.31, .32, .33, .35]

Function is a primary statement of purpose; it defines what a system or subsystem must accomplish to meet the system mission.

Function Flow Diagram is a diagram that graphically illustrates the relationships among functions.

Functional Interface is the interaction between functions, as in the flow of material or information between a sequence of activities.

Glass Transition Temperature is the temperature at which, upon heating, the glass transforms from a rigid solid to a viscous liquid. This temperature corresponds to glass viscosity of approximately 10^{13} poise, and is less than 500° C, for most, if not all, borosilicate waste glass.

Government-Managed Nuclear Materials consist of both SNF (e.g., DOE SNF and Naval SNF) and HLW (e.g., commercial, defense, and IPWF) that are in the custody of and will be accepted from a government agency.

High-Level Radioactive Waste (HLW) means (1) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (2) other highly radioactive material that the Nuclear Regulatory Commission, consistent with existing law, determines by rule requires permanent isolation. The CRWMS will only accept solidified HLW. For the purposes of this document, HLW is vitrified borosilicate glass cast in a stainless steel canister. (As defined in NWPA 42USC10101(12), 10 CFR 72.3, 10 CFR 960.2, 10 CFR 961.11, (Note that the 10 CFR 60 definition of HLW includes SNF. See definitions of commercial HLW and defense HLW.)

Important To Safety means necessary: (1)(Storage) to maintain the conditions required to store spent fuel safely; (2)(Storage) to prevent damage to the spent fuel container during handling and storage; or (3)(Storage) to provide reasonable assurance that spent fuel can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public; (4)(MGDS) to those engineered structures, systems, and components essential to the prevention or mitigation of an accident that could result in a radiation dose to the whole body, or any organ, of 0.5 rem or greater at or beyond the nearest boundary of the unrestricted area anytime until the completion of permanent closure of the repository.

Interface Requirement means a requirement that applies to the inputs to, or outputs from, the function; or the physical connection or dependence between architectural items.

Multi-Purpose Canister (MPC) refers to a sealed, metallic container maintaining multiple SNF assemblies in a dry, inert environment and overpacked separately and uniquely for the various system elements of storage, transportation, and disposal. (See definition of waste form.)

Nonconforming Waste Form is an individual HLW form that has been produced, handled, or stored such that its compliance with the WA-SRD requirements on waste forms cannot be demonstrated.

Nonstandard Waste Form is a nonconforming waste form and its nonconforming condition has been reviewed and deemed acceptable into the CRWMS. Nonstandard HLW may also be in a condition which requires special handling. This general definition is specifically applied to HLW and SNF in this requirements document.

Overpack is a structural component used to hold and protect the MPC so that the combination meets the NRC requirements for its application. There are several types of overpacks: one for transportation, 10 CFR 71; one for transfer, 10 CFR 72; one for storage, 10 CFR 72; and one for disposal, 10 CFR 60. An overpack is designed for its particular use in conjunction with the MPC.

Prime Mover is the vehicle providing motive power to the transporter.

Producer is any generator of high-level radioactive waste resulting from atomic energy defense activities or any producer of vitrified commercial HLW.

Product Consistency Test is an ASTM approved [ASTM C1285-94], crushed glass leachability test procedure used for measuring the concentration of chemical species released from a crushed glass to a test solution. The Product Consistency Test is not a measure of the glass composition itself.

Production Record is the documentation, provided by the Producer, that describes the actual canistered waste form.

Purchaser is any person, other than a Federal agency, who is licensed by the Nuclear Regulatory Commission to use a utilization or production facility under the authority of Sections 103 or 104 of the Atomic Energy Act of 1954 (42USC2133, 2134), or who has title to SNF or HLW and who has executed a contract or other contractual agreement with DOE. For purposes of this document, West Valley Demonstration Project (WVDP), which has commercial HLW, is considered a “Purchaser” only for contract/agreement purposes; otherwise WVDP is considered a “Producer.”

Radioactive Mixed Waste is waste containing both radioactive and hazardous components regulated by the AEA and RCRA, respectively. The term “radioactive component” refers only to the actual radionuclides dispersed or suspended in the waste substance.

RW-859 Data is data from Nuclear Fuel Data Form RW-859, submitted either annually or 90 days after startup of a new cycle by Purchaser which lists the site-specific total SNF inventory and projected discharges.

Special Nuclear Material means (1) plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the NRC, pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954 as amended, determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing but does not include source material. (As defined in 10 CFR 70.4.)

Specialty Engineering encompasses those disciplines that support the design process by applying knowledge from a specific area to ensure system operability in its operational environment. They include reliability, availability, maintainability, human factors engineering, safeguards and security, integrated logistics support, transportability, system safety, electromagnetic compatibility, parts/materials/processes and other specialist areas generally involved in development of systems. These specialties are integrated into the development effort through the system engineering process.

Spent Nuclear Fuel (SNF) is fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing. (As defined in NWPA 42USC10101(23).) SNF consists of commercial SNF and DOE-owned SNF.

Standard Waste Form is a waste form that meets the physical characteristics specified in the WA-SRD as standard. Other standard HLW forms will be defined in subsequent revisions of the WA-SRD. This general definition is specifically applied to HLW and SNF in this requirements document.

Storage and Shipping Records are the documents that describe the physical attributes of the canistered waste forms. The records also identify any unexpected events, such as thermal excursions, which have occurred during storage.

System Element is one of the elements of the CRWMS (Waste Acceptance, Transportation, Storage or MGDS). This differs from the “project” that may be initiated by DOE to manage and control development of one or more system elements (e.g., the Yucca Mountain Project or the WAST Project).

System Engineering Process is an iterative process encompassing changes at any point in the process. Possible impacts of change to the system should be analyzed during the conduct of the project. These impacts should be examined for validity, consistency, desirability, and attainability with respect to current technology, physical resources, human performance capabilities, life-cycle costs, and other constraints. The output of this analysis should either verify the existing requirements or lead to the development of new requirements that are more appropriate for the mission.

System, Structure, Component, or SSC, is a general term that means the standard English definition of those individual words. In this document, if and when an SSC is used in a way that requires any qualification, such as important to safety or important to waste isolation, that qualifier will also be provided.

Technical Baseline is a configuration identification document, or set of such documents, that is formally designated and approved at a specific time. Within the CRWMS, technical baseline is composed of, and evolves through, the functional and technical requirements baseline that is presented in the CRD and SRDs, the design requirements baseline, the final design baseline, and the as-built baseline. See CRD Section 1.2.1 for additional details.

To Be Determined (TBD) is used as a placeholder to identify information that is not yet defined.

To Be Verified (TBV) is used to identify information that is unqualified, preliminary, or that needs to be reevaluated.

Time-Temperature-Transformation Diagrams are used to depict specific glass type transition temperatures and the conditions at which different phases form.

Transportation Cask Subsystem, as a minimum, shall include the complete cask, an MPC (when required), truck trailer or rail car (defined as the transporter), a tie down system, an intermodal transfer device (when required), special tools and ancillary equipment.

Transporter is a cargo-carrying vehicle used for transportation of cargo. It includes semi-trailers, rail cars, intermodal transportation skids and equipment such as tie-down components, personnel barriers, etc. needed to make the loaded cargo-carrying vehicle transport-ready.

Waste Acceptance is the system element that manages the Accept Waste function which includes acceptance of SNF and HLW into the CRWMS from the Purchaser/ Custodian/Producer of such waste.

Waste Form is the radioactive waste material and any encapsulating or stabilizing matrix. A loaded MPC is a canistered waste form as defined in 10 CFR 60.2.

Waste Form Compliance Plan (WCP) is a document prepared by a waste producer describing planned analyses, tests, and engineering development work to be undertaken and information to be included in individual waste form production records to demonstrate compliance of a proposed waste form with Waste Acceptance Specifications.

Waste Form Qualification Report (WQR) is documentation prepared by a waste producer which describes results of analyses, tests, and engineering development work actually performed to demonstrate waste form compliance with Waste Acceptance Specifications.

Waste Package is the waste form and any containers, shielding, packing, and other absorbent materials immediately surrounding an individual waste container. (As defined in 10 CFR 60.2.)

APPENDIX B

ACRONYMS AND ABBREVIATIONS

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ACRONYMS AND ABBREVIATIONS

A

ACR	Annual Capacity Report
AEA	Atomic Energy Act
ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
APR	Acceptance Priority Ranking
ASTM	American Society for Testing and Materials

B

BWR	Boiling Water Reactor
------------	-----------------------

C

CFR	Code of Federal Regulations
CHLW	Commercial High-Level radioactive Waste
CRD	CRWMS Requirements Document
CRWMS	Civilian Radioactive Waste Management System

D

DCS	Delivery Commitment Schedule
DHLW	Defense High-Level Radioactive Waste
DOE	Department of Energy
DOE SNF	U.S. Department of Energy-Owned Spent Nuclear Fuel
DOT	Department of Transportation
DPC	Dual-Purpose Canister

E

EBR	Experimental Breeder Reactor
EM	Office of Environmental Management (DOE)
EPA	Environmental Protection Agency

F

FDS	Final Delivery Schedule
FICA	Facility Interface Capability Assessment
FRR	Foreign Research Reactor

H

HLW High-Level Radioactive Waste

I

IAEA International Atomic Energy Agency
IPWF Immobilized Plutonium Waste Form
ISNFDS Environmental Management Program's Integrated Spent Nuclear Fuel Database System

M

MC&A Material Control and Accounting
MD Office of Fissile Materials Disposition
MGDS Mined Geologic Disposal System
MGDS-RD Mined Geologic Disposal System Requirements Document
MOA Memorandum of Agreement
MPC Multi-Purpose Canister
MTHM Metric Tons Heavy Metal

N

NNPP Naval Nuclear Propulsion Program
NRC Nuclear Regulatory Commission
NS Nuclear Safety
NUREG Nuclear Regulatory Commission Technical Report
NWF Nuclear Waste Fund
NWPA Nuclear Waste Policy Act of 1982

O

OCRWM Office of Civilian Radioactive Waste Management (DOE)

P

Pu Plutonium
PWR Pressurized Water Reactor

Q

QA Quality Assurance
QARD Quality Assurance Requirements and Description

R

RAS	Requirements Analysis Sheet
RCRA	Resource Conservation and Recovery Act
RW	Office of Civilian Radioactive Waste Management (DOE)

S

SI	International System of Units
SNF	Spent Nuclear Fuel
SSC	Structure, System, and Component
SRD	System Requirements Document

T

TBD	To Be Determined
TBV	To Be Verified
TCS	Transportation Cask Subsystem
TMI	Three Mile Island
TRIGA	Training Reactor, Isotopics, General Atomics
Trans-SRD	Transportation System Requirements Document

U

USC	United States Code
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W

WA	Waste Acceptance System Element
WA-SRD	Waste Acceptance System Requirements Document
WAST	Waste Acceptance Storage and Transportation
WCP	Waste Form Compliance Plan
WQR	Waste Form Qualification Report
WVDP	West Valley Demonstration Project

Y

YMSCO	Yucca Mountain Site Characterization Office
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APPENDIX C

WA FUNCTION DESCRIPTION

Title: Waste Acceptance System Requirements Document

DI: E00000000-00811-1708-00001 REV 03

WA FUNCTION DESCRIPTION

1.1 Accept Waste

The Accept Waste function establishes the criteria for acceptable waste, establishes and maintains contracts/agreements with Purchasers/Custodians/Producers, collects fees, develops the plan for waste pickup, observes waste preparations, transfers the custody of the waste, resolves discrepancies in the waste description, and maintains Material Control and Accounting of waste accepted into the CRWMS.

The transfer of custody (including title), f.o.b. carrier, of spent nuclear fuel (SNF) or high-level radioactive waste (HLW)³ from all Purchasers/Custodians/Producers (who have executed a contract or an agreement with OCRWM) to OCRWM occurs at the Purchaser/Custodian/Producer sites as may be designated by the Purchaser/Custodian/Producer and approved by OCRWM. [10 CFR 961.11 Article I, Definitions - Expanded]

Inputs:

Plans, Data, Contract/Agreement
SNF Documentation
HLW Documentation
Loaded Transportation Cask Subsystems
Unloaded Transportation Cask Subsystems
Shipping Documents
Ancillary Equipment

From:

Purchaser/Custodian/Producer
Purchaser/Custodian
Producer
Purchaser/Custodian/Producer
1.2
1.2
1.2

Outputs:

Loaded Transportation Cask Subsystems
SNF Documentation
HLW Documentation
Documentation
Information
Unloaded Transportation Cask Subsystems
Reports
Contracts/Agreements

To:

1.2⁴
1.2, 1.3, 1.4
1.2, 1.3, 1.4
1.2
1.2
Purchaser/Custodian/Producer
Purchaser/Custodian/Producer
Purchaser/Custodian/Producer

³ Note that the 10 CFR 60 definition of HLW includes SNF

⁴ Responsibility for shipment from Custodian sites to CRWMS facilities has not been determined.

1.1.1 Define Waste Acceptance Criteria

Determine the conditions necessary to be met by the SNF/HLW, in order for DOE to be able to accept it for disposal including defining standard and nonstandard waste forms.

Inputs:	From:
----------------	--------------

Waste Characteristics	1.1.2
RW-859 Data	1.1.3
DOE SNF Data and Compliance Documentation	1.1.3
10 CFR 961	1.1.2
Waste Form Compliance Plan	1.1.3
Waste Form Qualification Report	1.1.3
Waste Data	1.1.3

Outputs:	To:
-----------------	------------

Waste Acceptance Criteria	1.1.2
---------------------------	-------

1.1.2 Establish Contracts/Agreements

Develop, execute, and maintain written agreements between DOE and Purchasers/Custodians/Producers that include terms, conditions, and criteria for waste acceptance and related services, and responsibilities of each party.

Inputs:	From:
----------------	--------------

Waste Characteristics	Purchaser/Custodian/Producer
Waste Acceptance Criteria	1.1.1

Outputs:	To:
-----------------	------------

Waste Characteristics	1.1.1
Contract/Agreement	1.1.3
	Purchaser/Custodian/Producer/DOE/ OCRWM
10 CFR 961	1.1.1 / 1.1.3

1.1.3 Plan for Waste Acceptance

Establish and provide the data on spent nuclear fuel and high-level waste characteristics and the Purchaser/Custodian/Producer site capabilities and requirements, as well as the CRWMS capabilities and requirements. Sub-functions include: Allocate Waste System Capacity; Identify Waste Locations/Characteristics; and Define Site Interface Capabilities.

Inputs:

RW-859 Data
DOE SNF Data and Compliance Documentation
Waste Form Compliance Plan
Waste Form Qualification Report
Production Records
10 CFR 961 Appendix A, B, C, D, E, F, G
Schedules, Plans
DCS
FDS
DCS Exchange Requests
Requests for Nonstandard Waste Delivery
Services Planning Documents
Site-Specific Servicing Plans
FICA

From:

Purchaser
Custodian
Producer
Producer
Producer
Purchaser
1.2
Purchaser
Purchaser
Purchaser/Producer
Purchaser/Custodian/Producer
Purchaser/Custodian/Producer / 1.2
Purchaser/Custodian/Producer / 1.2
1.2

Outputs:

Waste Data
Approved DCS
Approved FDS
RW-859 Data
DOE SNF Data and Compliance Documentation
Production Records
Waste Form Compliance Plan
Waste Form Qualification Report
Services Planning Documents
Site-Specific Servicing Plans
10 CFR 961 Appendix F
Information

To:

1.1.1/1.1.8
Purchaser / 1.1.4 / 1.2 / 1.3 / 1.4
1.1.4 / 1.2 / 1.3 / 1.4
1.1.1 / 1.1.8
1.1.1/1.1.8
1.1.4 / 1.2 / 1.4
1.1.1
1.1.1
Purchaser/Custodian/Producer / 1.2
Purchaser/Custodian/Producer / 1.2
1.1.8
1.1.8

1.1.3.1 Allocate Waste System Capacity

Using the priority ranking of Purchasers/Custodians/Producers, distribute projected throughput capability (based on total CRWMS capacity) among each Purchaser/Custodian/Producer for ten years of operation.

Inputs:

RW-859 Data
DOE SNF Data and Compliance Documentation
Waste Form Compliance Plan
Waste Form Qualification Report
Waste Acceptance Rate
APR
10 CFR 961 Appendix B, C, D, F, G

From:

Purchaser
Custodian
Producer
Producer
1.2 / 1.3 / 1.4
1.2 / 1.3 / 1.4
1.1.3.2

Outputs:

RW-859 Data
DOE SNF Data and Compliance Documentation
ACR
Waste Form Compliance Plan
Waste Form Qualification Report
Waste Data

To:

1.1.1 / 1.1.8
1.1.1/1.1.8
1.1.3.2
1.1.3.2
1.1.3.2
1.1.1/1.1.8

1.1.3.1.1 Collect Waste Data

Establish and provide the information on the Purchaser/Custodian/Producer SNF/HLW that is necessary for CRWMS planning and design. This information may be gathered on site at the Purchaser/Custodian/Producer are by other means.

Inputs:

RW-859 Data
DOE SNF Data and Compliance Documentation
Waste Form Compliance Plan
Waste Form Qualification Report
Other Commercial SNF Data
10 CFR 961 Appendix B, C, D, F, G

From:

Purchaser
Custodian
Producer
Producer
Purchaser
1.1.3.2

Outputs:

Waste Data
RW-859 Data
DOE SNF Data

To:

1.1.3.1.2
1.1.1 / 1.1.3.1.2
1.1.1/1.1.3.1.2

1.1.3.1.2 Rank/Order Waste

Establish and maintain a priority ranking for acceptance of waste into the CRWMS. For commercial SNF, the priority ranking is based on the date the SNF was permanently discharged, with the Purchasers with the oldest SNF, on an industry-wide basis, given the highest priority. The acceptance priority accrues to the Purchaser. Producer/Custodian priority ranking will be established by a method yet to be determined.

Inputs:

Waste Data
RW-859 Data
DOE SNF Data

From:

1.1.3.1.1
1.1.3.1.1
1.1.3.1.1

Outputs:

APR

To:

1.1.3.1.3

1.1.3.1.3 Allocate Annual Capacity to Purchasers/Custodians/Producers

Allocate acceptance capacity among Purchasers/Custodians/Producers according to CRWMS annual waste acceptance rate and APR.

Inputs:

APR
Waste Acceptance Rate

From:

1.1.3.1.2
1.2 / 1.3 / 1.4

Outputs:

ACR

To:

Purchaser/Cust./Producer / 1.1.3.2

1.1.3.2 Identify Waste Locations/Characteristics

Evaluate Purchaser/Custodian/Producer proposed waste locations and characteristics.

Inputs:

ACR
Waste Data
RW-859
DOE SNF Data and Compliance Documentation
Waste Form Compliance Plan
Waste Form Qualification Report
Submitted DCS
Submitted FDS
10 CFR 961 Appendix A, B, C, D, E, F, G
Submitted DCS Exchange Requests
Request for Nonstandard Waste Delivery
Production Records

From:

1.1.3.1
1.1.8.3
1.1.8.3
1.1.8.3
1.1.3.1
1.1.3.1
Purchaser
Purchaser
Purchaser
Purchaser
Purchaser/Producer
Producer

Outputs:

Approved DCS
Approved FDS
Production Records
10 CFR 961 Appendix B
10 CFR 961 Appendix C, D, F, G
Information

To:

1.1.3.3 / Purchaser / 1.2 / 1.3 / 1.4
Purchaser / 1.1.4/1.1.8/1.2/1.3/1.4
1.1.4 /1.1.8/ 1.2 / 1.4
1.1.3.1 / 1.1.4
1.1.3.1/1.1.8
1.1.8

1.1.3.2.1 Evaluate Delivery Commitment Schedule

Determine the feasibility of waste acceptance as proposed by the Purchaser/Custodian/Producer on the submitted forms as it corresponds to their allocation, site capabilities, and minimum acceptance requirements. Producer/Custodian process is yet to be determined.

Inputs:

Submitted DCS
Evaluation Support

From:

Purchaser
1.2

Outputs:

Approved DCS
Disapproved DCS
Evaluation Request

To:

Purchaser / 1.2/1.3/1.4 / 1.1.3.2.2
Purchaser
1.2

1.1.3.2.2 Evaluate DCS Exchange Requests

Determine the feasibility of exchanging approved DCSs.

Inputs:

Submitted DCS Exchange Request
Evaluation Support

From:

Purchaser
1.2

Outputs:

Approved DCS Exchange Request
Disapproved DCS Exchange Request
Evaluation Request

To:

Purchaser / 1.2 / 1.3 / 1.4
Purchaser
1.2

1.1.3.2.3 Evaluate Request for Nonstandard Waste Delivery

Determine the feasibility of accommodating suggested acceptance procedures for SNF/HLW that is other than standard waste.

Inputs:

Request for Nonstandard Waste Delivery
Evaluation Support

From:

Purchaser/Producer
1.2

Outputs:

Approved Request for Nonstandard Waste Delivery

Disapproved Request for Nonstandard Waste Delivery
Evaluation Request

To:

Purchaser/Custodian/Producer
1.2 / 1.3 / 1.4
Purchaser/Custodian/Producer
1.2

1.1.3.2.4 Evaluate Final Delivery Schedule

Determine the feasibility of accepting described waste on the proposed schedule. Producer/Custodian process is yet to be determined.

Inputs:

Submitted FDS
Evaluation Support

From:

Purchaser
1.2

Outputs:

Approved FDS
Disapproved FDS
Evaluation Request

To:

Purchaser / 1.2 / 1.3 / 1.4
Purchaser
1.2

1.1.3.2.5 Validate Description of Waste

Verify waste characteristics and provide notification of and information to support resolution of improperly described waste. For commercial SNF, perform RW-859 database queries to support verification.

Inputs:

Production Records
Waste Form Qualification Report
Submitted DCS
Submitted FDS
10 CFR 961 Appendix A, B, C, D, E, F, G
RW-859 Data
DOE SNF Data and Compliance Documentation
Waste Data

From:

Producer
1.1.3.1
Purchaser
Purchaser
Purchaser
1.1.8.3
1.1.8.3
1.1.8.3

Outputs:

Notification of improperly described waste
Information

To:

Purchaser/Custodian/Producer/
1.2 / 1.3 / 1.4 / 1.1.6
Purchaser/Custodian/Producer/
1.2 / 1.3 / 1.4 / 1.1.6

1.1.3.3 Define Site Interface Capabilities

Determine the interface capabilities at each Purchaser/Custodian/Producer site to ensure that they can be accommodated by the CRWMS equipment and facilities.

Inputs:

FICA
Approved DCS
Draft Services Planning Documents
Services Planning Documents Approval/Comments

From:

1.2
1.1.3.2
1.2
Purchaser/Custodian/Producer

Draft Site-Specific Servicing Plans	1.2
Site-Specific Servicing Plans Approval/Comments	Purchaser/Custodian/Producer

Outputs:

To:

Draft Services Planning Documents for Review/Approval	Purchaser/Custodian/Producer
Services Planning Documents Approval/Comments	1.2
Draft Site-Specific Servicing Plans for Review/Approval	Purchaser/Custodian/Producer
Site-Specific Servicing Plans Approval/Comments	1.2

1.1.3.4 Schedule WA Preparations

Determine the schedule for WA participation in Purchasers/Custodians/Producers loading operations and develop contingency plans for WA operations. This includes scheduling personnel assignments, equipment needs and interfacing with Transportation personnel, as necessary.

Inputs:

From:

DCS	Purchaser
FDS	Purchaser
DCS Exchange Requests	Purchaser
Requests for Nonstandard Waste Delivery	Purchaser/Producer
Services Planning Documents	Purchaser/Custodian/Producer/1.2
Site-Specific Servicing Plans	Purchaser/Custodian/Producer/1.2
FICA	1.2

Outputs:

To:

Schedules, Plans	Purchaser/Custodian/Producer/ 1.1.4 / 1.1.8
------------------	--

1.1.4 Observe Waste Preparations

Verify the identified waste to be delivered is in agreement with its corresponding documentation. Verification may be accomplished by certification by the Purchaser/Custodian/Producer and/or by independent direct methods including observation by DOE representatives.

Inputs:

Schedules, Plans
SNF
HLW
FDS
10 CFR 961 Appendix F
Production Records
Unloaded Transportation Cask Subsystems
Empty MPC

From:

1.1.3.4
Purchaser/Custodian
Producer
1.1.3
1.1.3
1.1.3
1.2
1.2

Outputs:

Documentation, Findings
Notification of Discrepancy
Proposed Resolution
SNF/HLW Documentation
Loaded Transportation Cask Subsystems
Loaded MPC

To:

1.1.5
Purchaser/Custodian/Producer
Purchaser/Custodian/Producer
1.1.5
1.1.5
1.1.5

1.1.4.1 Observe Preliminary Waste Preparations

Observe and record preparation activities prior to acceptance and including SNF/HLW loading into MPC/TCS.

Inputs:

Information

From:

Purchaser/Custodian/Producer

Outputs:

Verified Documentation, Findings

To:

1.1.4.2

1.1.4.1.1 Observe Waste Preparations & Loading

Observe the activities of getting the SNF/HLW ready for acceptance (including review of techniques used to classify the waste) to ensure that it is appropriate to the transportation cask subsystem (including MPC), storage facility and repository provided by the CRWMS.

Inputs:

Information

From:

Purchaser/Custodian/Producer

Outputs:

Verified Documentation, Findings

To:

1.1.4.2

1.1.4.1.2 Record Waste Loading

Record observations during waste preparations prior to acceptance and during loading of SNF/HLW into MPC/TCS. Store records at Waste Acceptance for possible review for process improvement studies.

Inputs:

Information

From:

Purchaser/Custodian/Producer

Outputs:

NONE

To:

1.1.4.2 Verify Waste Description

Verify that the contents being placed into the MPC (if required) and the transportation cask correspond to those described in the submitted documentation.

Inputs:

FDS
Verified Documentation, Findings
Information

From:

1.1.3
1.1.4.1.1
Purchaser/Custodian/Producer

Outputs:

Verified Documentation, Findings

To:

1.1.4.3 / 1.1.5

1.1.4.3 Notify Purchaser/Custodian/Producer of Improperly Described Waste

Prior to DOE/OCRWM taking title to the waste, resolve any identified discrepancy between the description of the waste provided in documentation and the actual contents of the transportation cask with the Purchaser/Custodian/Producer.

Inputs:

Verified Documentation, Findings

From:

1.1.4.2

Outputs:

Notification of Discrepancy
Proposed Resolution

To:

Purchaser/Custodian/Producer
Purchaser/Custodian/Producer

1.1.5 Accept Waste Title/Documentation

Transfer documents between DOE/OCRWM and the Purchaser/Custodian/Producer at the time of acceptance. Documents may include certification of cask transportation readiness. Confirm completeness and compliance, and accept title to waste. For commercial SNF and HLW, turn over to Transportation for off-site removal.³

Inputs:

Documentation, Findings
Title
Documentation
SNF/HLW Documentation
Loaded Transportation Cask Subsystems
Loaded MPC
DOE/NRC Forms-741 & 742
Resolved Waste Description
DOE/NRC Form 741

From:

1.1.4
Purchaser/Custodian/Producer
Purchaser/Custodian/Producer
1.1.4
1.1.4
1.1.4
Purchaser
1.1.6
Custodian/Producer

Outputs:

Title
Documentation
SNF Documentation
HLW Documentation
Loaded Transportation Cask Subsystems
Loaded MPC
DOE/NRC Forms-741 & 742

To:

DOE/OCRWM
DOE/OCRWM / 1.1.6 / 1.2
1.3 / 1.4
1.4
1.2
1.2
1.1.8

1.1.6 Resolve Improperly Described Waste

When a discrepancy is found with the waste after DOE/OCRWM has taken title to it, make arrangements with the Purchaser/Custodian/Producer to correct the waste description.

Inputs:

Waste Description
Resolved Waste Description
DOE/NRC Forms-741 & 742
DOE/NRC Form 741

From:

1.3 / 1.4
Purchaser/Custodian/Producer
Purchaser
Custodian/Producer

Outputs:

Notification of Proposed Resolution
Resolved Waste Description
DOE/NRC Forms-741 & 742

To:

Purchaser/Custodian/Producer
1.1.5 / 1.3 / 1.4
1.1.8

1.1.7 Support Fee Collection

Collect, verify, and assess the adequacy of 1) fees paid into the Nuclear Waste Fund (NWF) and 2) appropriation into the Defense Nuclear Waste Disposal Account. Recommend adjustment of the fee, if necessary, in order to ensure full cost recovery. Fees for waste disposal services will be paid by the Purchasers/Custodians/Producers. DOE will regularly review and verify the accuracy of all fees paid/allocated into the funds.

Inputs:

Fees
OCRWM Program Cost Estimates

From:

Purchaser/Custodian/Producer
DOE

Outputs:

Fees
Fee Adequacy Assessment
Payment Received Notification

To:

Nuclear Waste Fund
DOE Secretary
1.1.3

1.1.8 Control and Account for Waste Inventory

Control, account for, and track the SNF and HLW inventory after it is accepted into the CRWMS and feed all systems that similarly track Material Control and Accountability (MC&A) data records. Additionally, the SNF and HLW will be tracked prior to acceptance into the CRWMS.

Inputs:

From:

Schedules, Plans	1.1.3.4
10 CFR 961 Appendix F	1.1.3
Waste Data	1.1.3
DOE SNF Data and Compliance Documentation	1.1.3
RW-859 Data	1.1.3
FDS	1.1.3
SNF Specifications	1.1.3
Production Records	1.1.3
DOE/NRC Forms-741 & 742	1.1.5 / 1.1.6 / 1.2 / 1.3 / 1.4
Information	1.1.3

Outputs:

To:

Information	Purchaser/Producer/NRC/IAEA
	1.2 / 1.3 / 1.4

1.1.8.1 Perform Material Control

Control inventory of SNF and HLW within the CRWMS.

Inputs:

From:

10 CFR 961 Appendix F	1.1.3
FDS	1.1.3
SNF Specifications	1.1.3
Production Records	1.1.3
DOE/NRC Forms-741 & 742	1.1.5 / 1.1.6 / 1.2 / 1.3 / 1.4

Outputs:

To:

Information	Purchaser / Producer / NRC / IAEA
	1.2 / 1.3 / 1.4

1.1.8.2 Provide Material Accounting

Account for the location of SNF and HLW within the CRWMS. The accounting function will include conducting periodic physical verification of materials, validating and reconciling accounting ledger data of materials in inventory prior to disposal, and supporting the maintenance of MC&A records after final disposal.

Inputs:

10 CFR 961 Appendix F
FDS
SNF Specifications
Production Records
DOE/NRC Forms-741 & 742

From:

1.1.3
1.1.3
1.1.3
1.1.3
1.1.5 / 1.1.6 / 1.2 / 1.3 / 1.4

Outputs:

Information

To:

Purchaser / Producer / NRC / IAEA
1.2 / 1.3 / 1.4

1.1.8.3 Provide Material Tracking

Track the location of SNF and HLW prior to and after acceptance into the CRWMS.

Inputs:

10 CFR 961 Appendix F
RW-859 Data
Waste Data
DOE SNF Data and Compliance Documentation
FDS
SNF Specifications
Production Records
DOE/NRC Forms-741 & 742
Information

From:

1.1.3
1.1.3
1.1.3
1.1.3
1.1.3
1.1.3
1.1.3.2
1.1.5 / 1.1.6 / 1.2 / 1.3 / 1.4
1.1.3.2

Outputs:

Information

Waste Data
DOE SNF Data and Compliance Documentation
RW-859 Data

To:

Purchaser / Producer / NRC / IAEA
1.2 / 1.3 / 1.4
1.1.3.2
1.1.3.2
1.1.3.2

1.1.8.4 MC&A General Management

This function provides the general management over the MC&A functions. It serves to organize and provide guidance to MC&A operations within the CRWMS. This includes developing high level management procedures for MC&A, training of personnel, archival and retrieval of records and general management.

Inputs:

Information

From:

1.1.3

Outputs:

Information

To:

Purchaser / Producer / NRC / IAEA
1.2 / 1.3 / 1.4

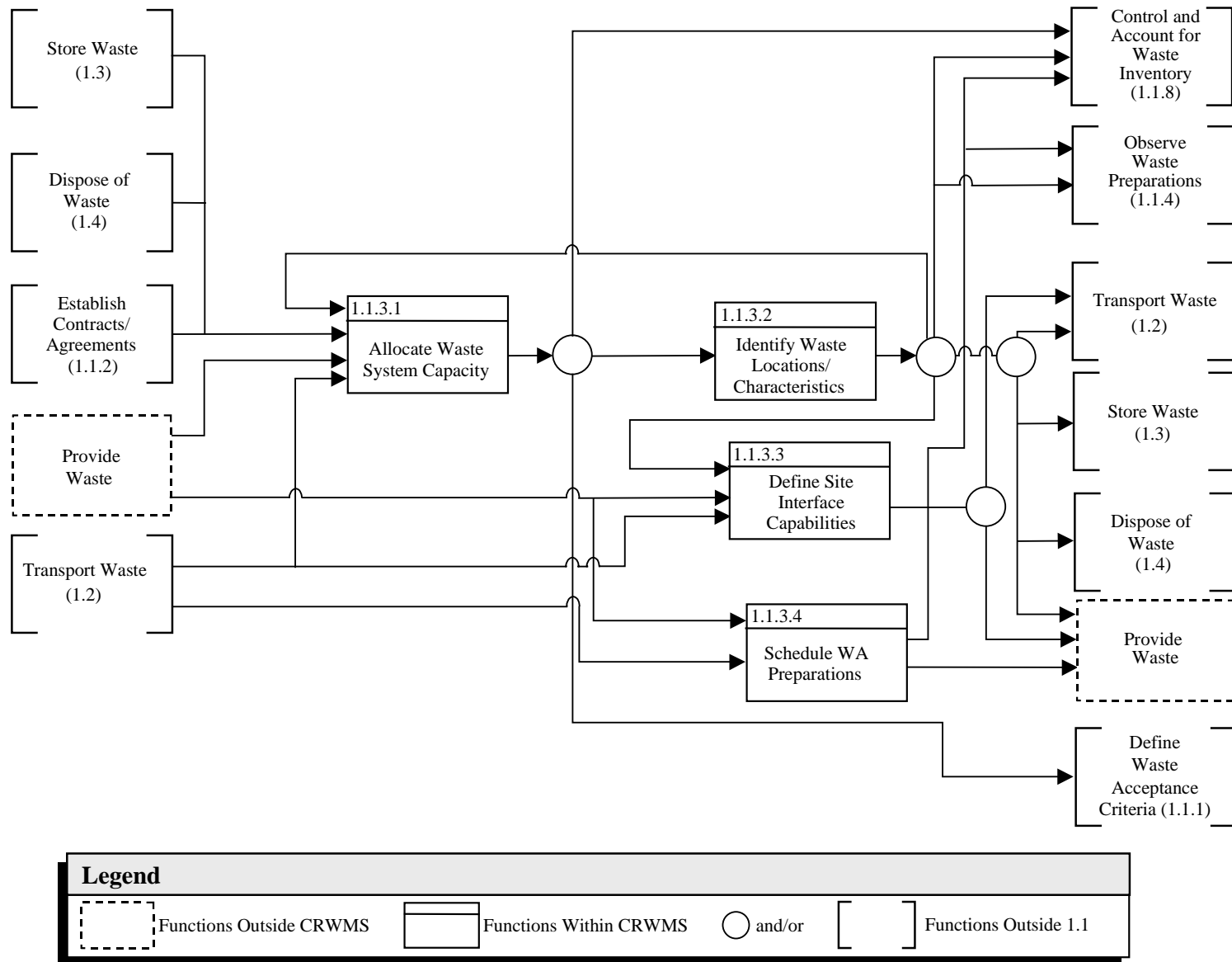


Figure C-1. 1.1.3 Plan for Waste Acceptance Functional Flow Diagram

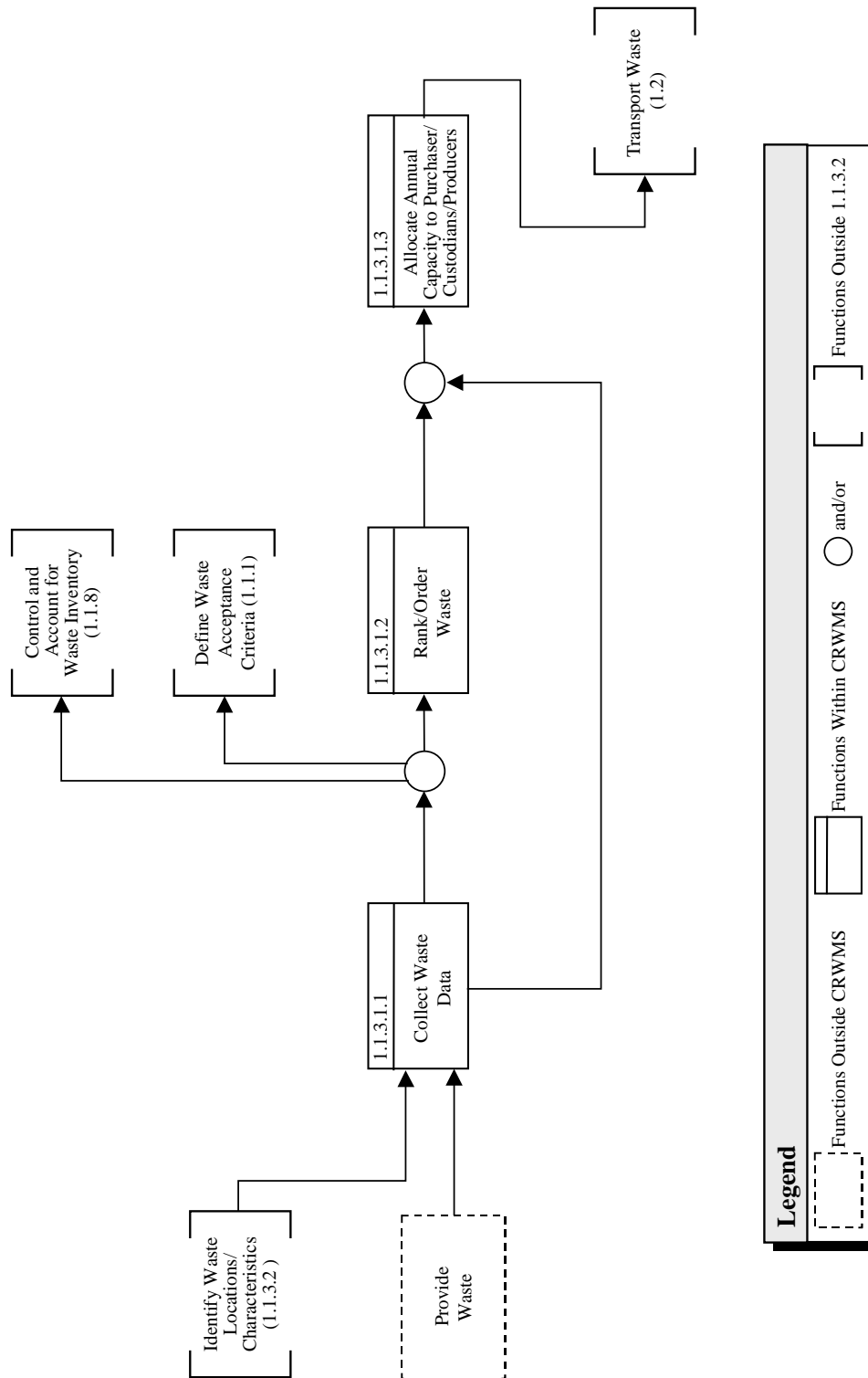


Figure C-2. 1.1.3.1 Allocate Waste System Capacity Functional Flow Diagram

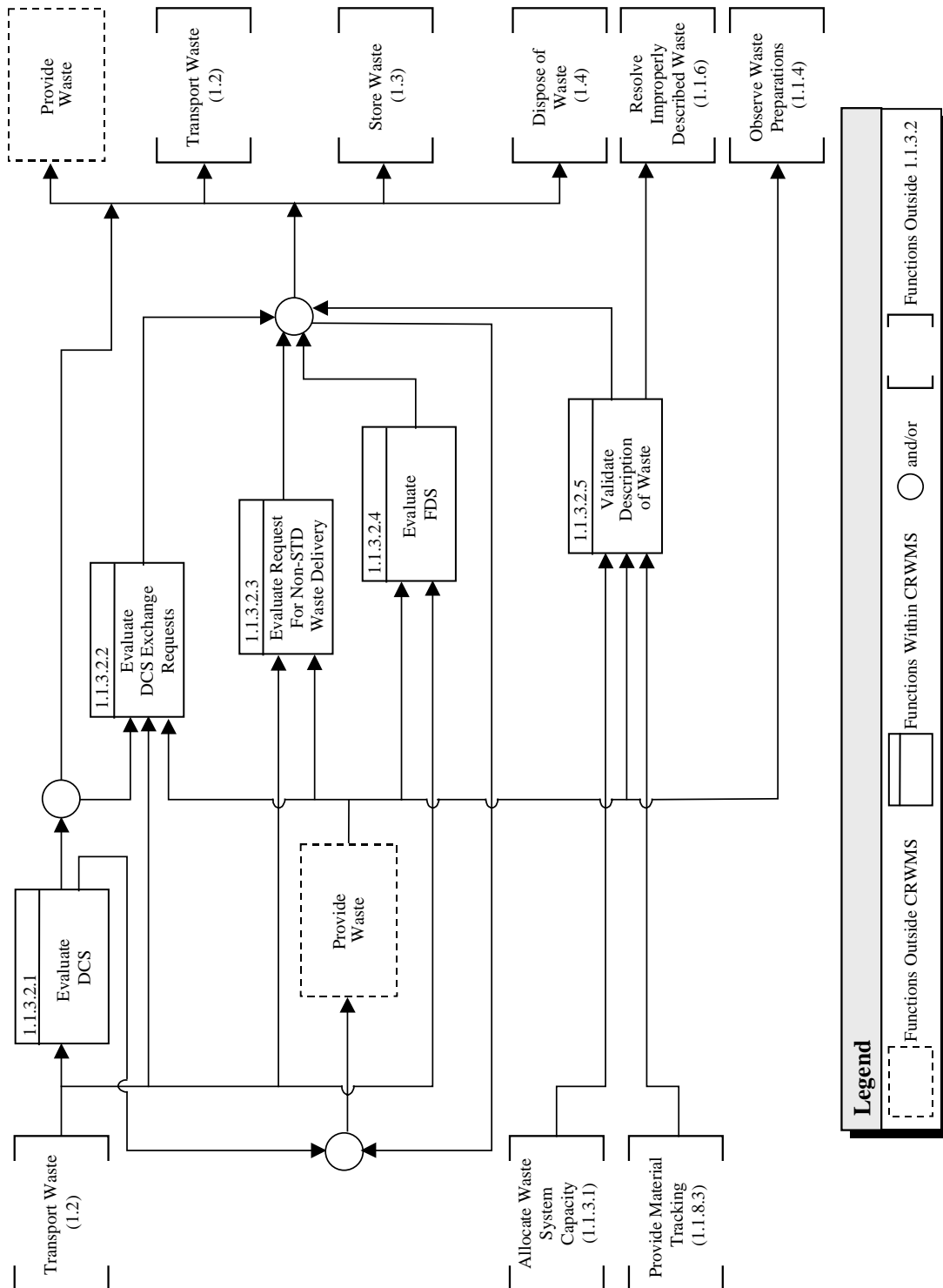


Figure C-3. 1.1.3.2 Identify Waste Locations/Characteristics Functional Flow Diagram

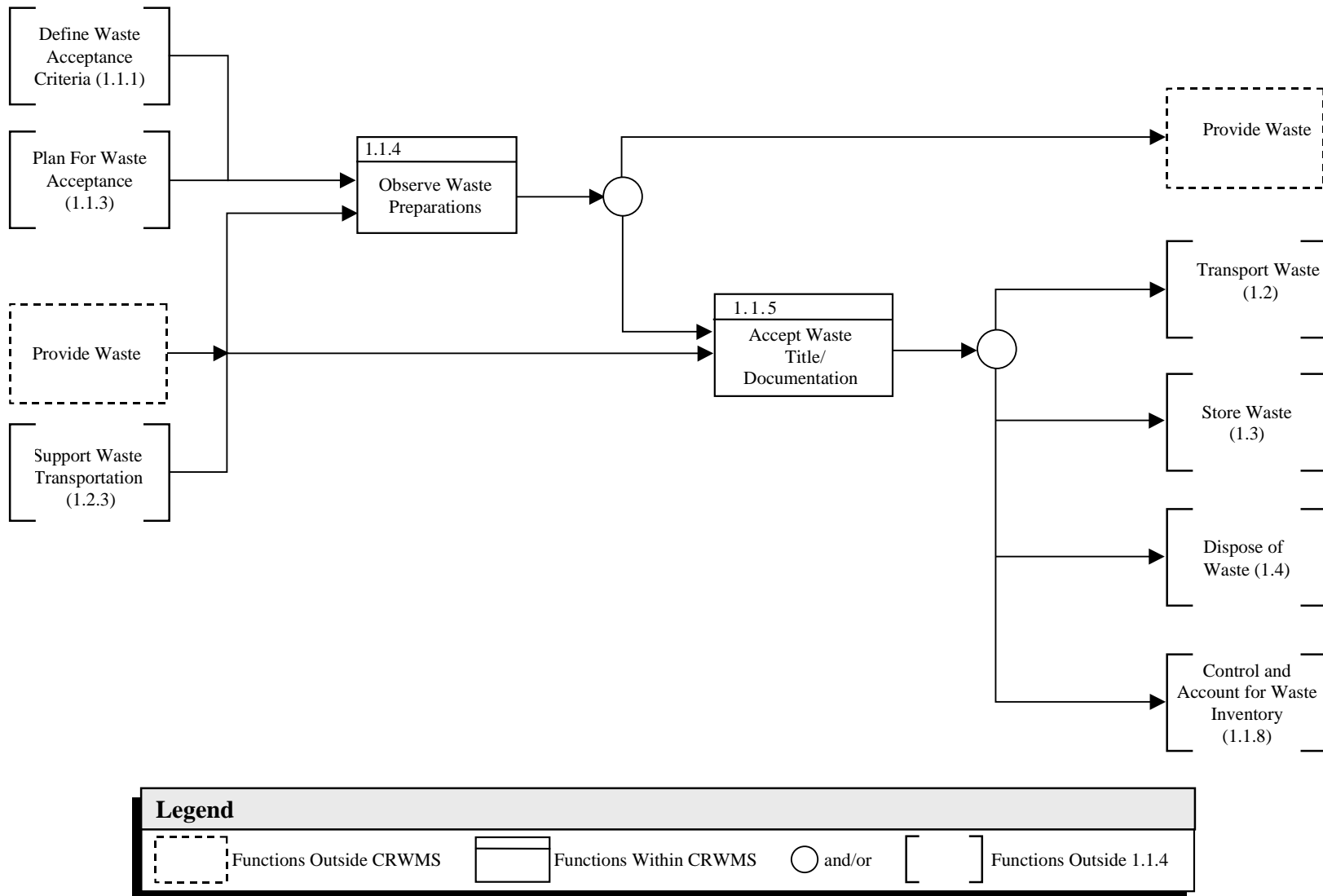


Figure C-4. Accept Waste Custody Functional Flow Diagram

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